

First report of *Tmarus hystrix* (Simon 1895) (Araneae: Thomisidae) from India

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ABSTRACT

The paper gives the first occurrence report of *Tmarus hystrix* (Simon 1895) from India, as well as the first report of this genus from the Indian state of Uttarakhand. This species is currently reported only from Sri Lanka, highlighting this as the northernmost range extension for the species.

Keywords: crab spider, first report, range extension, Indo Malayan realm, India

1. INTRODUCTION

Thomisidae constitutes one of the largest spider families represented by 171 globally recognized genera and 2159 species, of which 180 species are known to occur in India (WSC 23.0). Commonly referred to as “crab spiders” attributed to their laterigrade leg positioning, members of this family occupy a range of microhabitats, including foliage, flowers, tree barks, and leaf litter (Arachchi and Benjamin, 2019). Thomisids are known to blend in effortlessly with their immediate environment, exhibiting a wide array of body colorations (Yang et al., 2005).

The genus *Tmarus*, erected by Simon in 1875, houses small-medium sized spiders characterised by a flat cephalothorax and elongated abdomen with a prominent caudo-dorsal hump (Arachchi and Benjamin, 2019). They can be easily differentiated from other genera by a combination of the following features: Carapace with long setae; lateral eyes much larger than median eyes; tubercles of lateral eyes developed, placed close to each other; cheliceral tooth absent; female palp with claw; male palp with VTA and RTA, often with ITA and DTA; simple bulb without apophysis, with a short and thick embolus; abdomen pyriform, the posterior end occasionally extending beyond spinnerets; epigynum often with median hood and short and thick copulatory ducts; spermathecae small, global, oval, or reniform (Ono, 1988; Yang et al., 2005). The genus currently hosts 226 global species, 6 of which are reported from India (WSC 23.0).

Tmarus hystrix was first reported by Simon in 1895, misidentified as *Peritraeus hystrix*, and was subsequently revised under *Tmarus* (Arachchi and Benjamin, 2019). Currently, the species remains reported only from Sri Lanka. The current paper provides the first report of the species from India, while

also accounting for the first report of the genus from the Himalayan state of Uttarakhand.

2. MATERIALS AND METHODS

While documenting the spider species of BSI campus, the specimen was collected from a Chrysanthemum plant from the residential campus garden of the Botanical Survey of India (BSI), Dehradun on May 20, 2020, and preserved in 100% ethanol. Species confirmation was based on the epigynal description of Arachchi and Benjamin (2019) under Olympus SZX7 microscope. Morphometries and photography were done using MICAPS camera attachment with Carton DSZ-45T microscope, and ToupView software. The specimen is currently deposited at the Wildlife Institute of India, Dehradun, but may be moved to a national collection subsequently. All measurements are in mm.

3. RESULTS

Taxonomy

Tmarus hystrix (Simon 1895) (Figure 1-4)



Figs 1-4. *Tmarus hystrix* female. 1. Habitus, dorsal; 2. Eye arrangement; 3. Epigynum, external; 4. Internal genitalia.

Material examined: *Tmarus hystrix* (female), Botanical Survey of India, NRC, Dehradun (Residential campus), Uttarakhand, India, 30°20'54.32"N, 78° 0'53.37"E, 20.5.2020, Amber Srivastava (AS151), 1 female (AS151).

Description: Total length 4.48; Cephalothorax length 1.82, width 1.71; Abdomen length 2.58, width 1.65. Cephalothorax almost as long as wide, oval, brown, mottled with darker patches, covered in sparse setae; fovea conspicuous with deep radiating furrows extending anteriorly and laterally till cephalothorax margin with 2-3 symmetrically placed dark brown spots. Posterior region of cephalothorax brownish-yellow, lighter anteriorly under fovea groove, unmarked. Ocular tubercles grey. Inner MOQ margin bordered with dark brown mottles on white under surface. Lateral margin covered in undulating dark brown stripes. AME 0.07, PME 0.07, ALE 0.19, PLE 0.16. AME-ALE 0.11, PME-PL 0.23, PME-PME 0.23, AME-AME 0.15, ALE-PL 0.23, adjacent. OA width 1.19, length 0.41. MOA length 0.33, back width 0.44, front width 0.34. Sternum length 0.95, width 0.76, pale yellow, oval, mildly tapering

posteriorly. Chelicerae length 0.8, width 0.53, pale yellow with dark brown margin. Abdomen longer than wide, reddish brown with dirty grey patches, sparsely covered with setae, uniformly mottled with dark brown spots. Posterior margin of caudo-dorsal hump darker. Ventrally white with brown spots along lateral and mid-linear margin extending till spinnerets. Legs long, slender, pale yellow, inter-spread with fine hair and short stiff bristles. Leg measurements: I: fe 2.2, pa 0.96, ti 1.84, mt 1.69, ta 0.88 (7.57); II: fe 2.05, pa 0.91, ti 1.9, mt 1.59, ta 0.79 (7.24); III: fe 1.48, pa 0.61, ti 1.29, mt 0.71, ta 0.54 (4.63); IV: fe 1.56, pa 0.57, ti 1.08, mt 0.91, ta 0.80 (4.92). Epigynal hood elongated, anterior tip of hood and copulatory ducts sclerotised, opening into kidney-shaped spermathecae having intricate folds.

Type locality: Kandy, Sri Lanka.

Distribution: Sri Lanka, India (present study).

4. DISCUSSION

The occurrence of *T. hystrix* in India offers novel insights into the ecological range of the species, extending it northwards within the Indo-Malayan realm to the Indian Himalayan foothills, from its previously known Sri Lankan endemic record. Authors believe that this species may occur, either contiguously or in pockets, across the length of the Indian subcontinent, but remains yet to be reported from other states. The collection locality of the specimen from a residential garden also highlights the possibility of varied anthropogenic tolerance in the species. This stands in contrast to the habitat preference provided by Arachchi and Benjamin (2019), enlisting all existing records from forest habitats. The general habitus of the specimen also varies from its Sri Lankan counterpart with more contrasting coloration and a significantly paler posterior cephalothorax region. The anterior margin of the abdomen is also more pronounced with sharper edges, shorter pedicle, in addition to a more prominent caudo-dorsal hump. Morphological variations could be environmentally attributable, although accurate derivations remain yet to be assessed. Furthermore, intense sampling efforts yielded only a single specimen capture, indicating that this species may be rare or highly cryptic in the Indian locality. This discovery marks the first occurrence of this species from India, as well as the first report of the genus from the state of Uttarakhand.

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Author contributions

IDS- Identification of specimen and original draft preparation with the support of MS; AS- Field investigation and sample collection, review of draft; MS- Expert advise on specimen identification and taxonomy, supervision of findings with critical reviews. All authors discussed the results and contributed to the final manuscript.

Abbreviations:

ALE- Anterior Lateral Eyes; AME- Anterior Median Eyes; MOA- Median Ocular Area; Mt- Metatarsus; OA- Ocular Area; Pa- patella; PLE- Posterior Lateral Eyes; PME- Posterior Median Eyes; Ta- Tarsus; Ti- Tibia.

Ethical approval

Tmarus hystrix (Simon 1895) (Araneae: Thomisidae) from India was observed in the study. The Animal ethical guidelines are followed in the study for species observation & identification.

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This study has not received any external funding.

Conflicts of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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